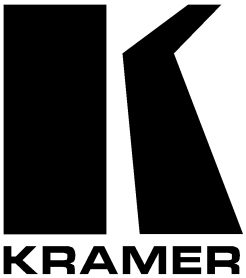
Kramer Electronics, Ltd.



USER MANUAL

Model:

RC-1000N

Wall Plate Master Controller

Contents

1	**Introduction**	**1**
2	**Getting Started**	**1**
3	**Overview**	**2**
4	**Your RC-1000N**	**3**
5	**Configuring the RC-1000N**	**5**
5.1	Connecting the RC-1000N	5
5.2	Controlling via RS-232 (for example, using a PC)	7
5.3	Connecting via the RS-485 Terminal Block Connector	7
5.4	Assigning Machine Numbers	8
5.5	Dipswitch Settings	8
6	**Using the RC-1000N**	**9**
6.1	Selecting a Switcher	9
6.2	Switching an Input to an Output	10
6.3	Disconnecting an Output	11
6.4	Locking the Front Panel	11
6.5	Routing to a Selected Output (One Touch Mode)	12
7	**Flash Memory Upgrade**	**13**
7.1	Downloading from the Internet	13
7.2	Connecting the PC to the RS-232 Port	13
7.3	Upgrading Firmware	14
8	**Technical Specifications**	**18**

Figures

Figure 1: RC-1000N Front View 3
Figure 2: RC-1000N Rear View 4
Figure 3: Connecting the RC-1000N 6
Figure 4: Connecting the RC1000N to a PC 7
Figure 5: Splash Screen 14
Figure 6: Atmel – Flip Window 14
Figure 7: Device Selection Window 15
Figure 8: Selecting the Device from the Selection Window 15
Figure 9: Loading the Hex 16
Figure 10: RS-232 Window 16
Figure 11: Atmel – Flip Window (Connected) 17
Figure 12: Atmel – Flip Window (Operation Completed) 18

Tables

Table 1: RC-1000N Features – Front View 3
Table 2: RC-1000N Features – Rear View 4
Table 3: Dipswitch Definitions 8
Table 4: Technical Specifications of the RC-1000N 18

1 Introduction

Welcome to Kramer Electronics (since 1981): a world of unique, creative and affordable solutions to the infinite range of problems that confront the video, audio and presentation professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 350-plus different models now appear in 8 Groups[1], which are clearly defined by function.

Congratulations on purchasing your **RC-1000N**, which is ideal for:

- Presentation applications involving many signal sources
- Studio control

The package includes the following items:

- **RC-1000N**
- Power adapter (12V DC Input)
- This user manual[2]

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high performance high resolution cables[3]

1 GROUP 1: Distribution Amplifiers; GROUP 2: Video and Audio Switchers, Matrix Switchers and Controllers; GROUP 3: Video, Audio, VGA/XGA Processors; GROUP 4: Interfaces and Sync Processors; GROUP 5: Twisted Pair Interfaces; GROUP 6: Accessories and Rack Adapters; GROUP 7: Scan Converters and Scalers; and GROUP 8: Cables and Connectors

2 Download up-to-date Kramer user manuals from the Internet at this URL: http://www.kramerelectronics.com

3 The complete list of Kramer cables is on our Web site at http://www.kramerelectronics.com

3 Overview

The Kramer Wall Plate **RC-1000N** is a unique two-gang remote control unit designed for broadcast and industrial studio applications. You can use the **RC-1000N** to configure up to 16 Kramer RS-232 and RS-485 controlled matrix switchers.

In particular, the **RC-1000N**:

- Lets you connect a PC or other control system via the controller's RS-232 serial port[1] for remote control
- Has 16 illuminated input/output buttons and a 7-segment display for easy configuration of each switcher
- Features a TAKE button, to confirm actions
- Features one-touch-mode operation
- Has a LOCK button to prevent tampering with the front panel
- With its FLASH memory, lets you upgrade to the latest Kramer firmware version via Internet download
- Recalls the previous setup after powering up
- Can be built into a control table, and is fed from a 12V DC source

To achieve the best performance:

- Connect only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Avoid interference from neighboring electrical appliances and position your **RC-1000N** away from moisture, excessive sunlight and dust

1 Or via the RS-485 port

4 Your RC-1000N

Figure 1 and Table 1 define the front view of the **RC-1000N**:

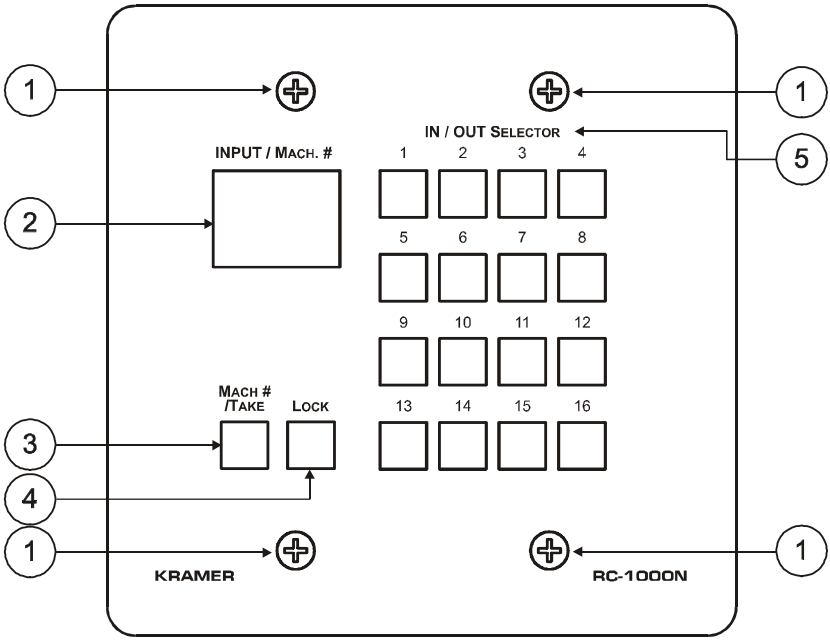


Figure 1: RC-1000N Front View

Table 1: RC-1000N Features – Front View

#	Feature	Function
1	Holes (4)	For fastening the wall plate in place
2	*INPUT / MACH. #* 7-segment Display	Shows the MACHINE # or the INPUT # or error
3	*MACH #/TAKE* Button	Determines the functionality of the IN / OUT SELECTOR buttons (from 1 to 16) In the TAKE mode[1]: press to confirm and complete switching of an input to an output In the MACH # mode[2]: set the switchers' machine #
4	*LOCK* Button	Disengages the front panel buttons (see section 6.4)
5	IN / OUT SELECTOR Buttons	Press to select either the MACH # or the input and output number when switching an input to the output[1] (from 1 to 16)

1 In the Take mode (which is the regular operation mode), the MACH #/TAKE button blinks only to confirm a switching action, otherwise it is not lit

2 To enter the Mach # mode, press and hold the MACH #/TAKE button for a few seconds, after which the buttons blinks

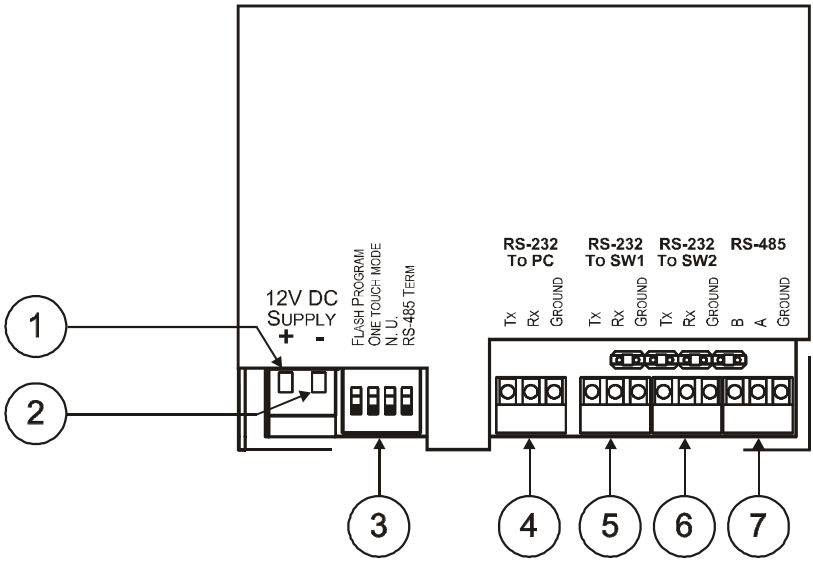


Figure 2: RC-1000N Rear View

Table 2: RC-1000N Features – Rear View

#	Feature		Function
1	*12V DC SUPPLY*	+	Connect (+) to the connector for powering the unit
2		-	Connect (-) to the Ground
3	Setup Dipswitches		Rear panel setup dipswitches 1 to 4 (see section 5.4)
4	*RS-232 TO PC* 3-pin connector		Connects to PC
5	*RS-232 To SW 1* 3-pin connector		Connects to the RS-232 DB 9 port on a Kramer switcher
6	*RS-232 To SW 2* 3-pin connector		Connects to the RS-232 DB 9 port on a Kramer switcher
7	*RS-485* Port		Connects to the RS-485 detachable terminal block on a switcher or PC

5 Configuring the RC-1000N

You can configure the **RC-1000N** to control up to 16 Kramer switchers. The example in Figure 3 illustrates how to configure the **RC-1000N** by connecting a:

- **VP-1201** *12x1 XGA Switcher / Scanner* to the RS-232 TO SW 1 port
- **VP-8x8A** *8x8 VGA / UXGA / Audio Matrix Switcher* to the RS-485 port of the **VP-1201**
- **VP-8x8** *VGA / UXGA Matrix Switcher* to the RS-485 port of the **RC-1000N**
- **VP-1608** *16x8 RGBHV / Balanced Audio Matrix* to the RS-485 port on the **VP-8x8**

5.1 Connecting the RC-1000N

To connect[1] the **RC-1000N**, as illustrated in Figure 3, do the following:

1. Connect a switcher (for example, the **VP-1201**) to the RS-232 SW 1 port of the **RC-1000N**.
2. Connect a switcher (for example, the **VP-8x8A**) via the RS-485 port of the **VP-1201** (see section 5.3).
3. Connect a switcher (for example, the **VP-8x8**) to the RS-485 terminal block connector on the **RC-1000N**.
4. Connect a switcher (for example, the **VP-1608**), via the RS-485 port of the **VP-8x8** (see section 5.3).
5. Assign a machine number for each switcher (see section 5.4).
6. On the **RC-1000N**, set the dipswitches as required (see section 5.5).
7. If required, connect the RS-232 TO PC port on the **RC-1000N** to the RS-232 DB 9 port on the PC or controller.
8. Connect your 12V DC power supply to the 12V DC SUPPLY pins[2], taking care that the **polarity is correct**.

1 Switch OFF the power on each device before connecting it to your RC-1000N. After connecting your RC-1000N, and assigning a machine number for each switcher (see section 5.4), switch on the power on each device

2 Connect the wire labeled "+" to the +12V pin, and the wire labeled "–" to the GND pin

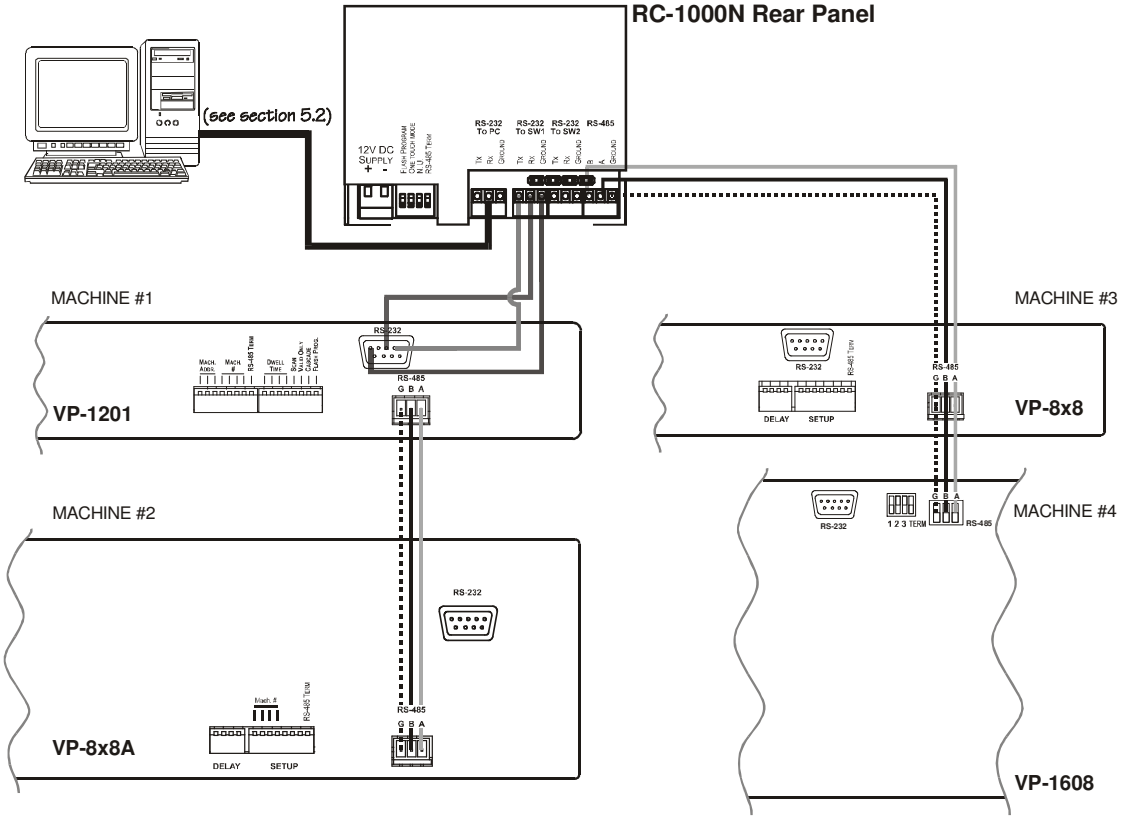


Figure 3: Connecting the RC-1000N

5.2 Controlling via RS-232 (for example, using a PC)

The **RC-1000N** is connected to a PC via the RS-232 TO PC port for remote control.

When connecting the **RC-1000N** to a PC you can control all of the switchers functions (such as, audio switching, store and recall, and so on) in addition to performing switching operations.

Connect a PC to the **RC-1000N** unit, as Figure 4 illustrates

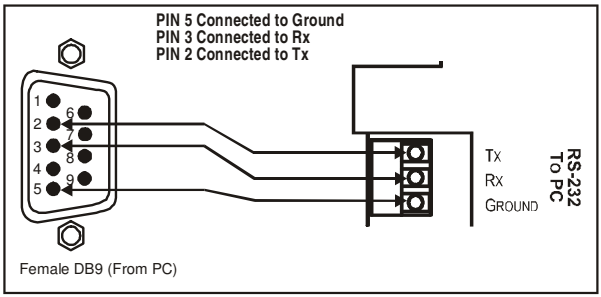


Figure 4: Connecting the RC1000N to a PC

5.3 Connecting via the RS-485 Terminal Block Connector

The **RC-1000N** can control several switchers, which are connected via the RS-485 terminal block connectors. For example, in Figure 3, the **VP-1608** is connected to the **RC-1000N** via the RS-485 connector of the **VP-8x8**[1].

To connect additional switchers via RS-485, as illustrated in Figure 3, do the following:

1. Connect the RS-485 terminal block connector of the **RC-1000N** to the RS-485 port on the **VP-8x8** unit, as follows:
   - Connect the "A" (+) PIN on the RS-485 rear panel port of the **RC-1000N** to the "A" (+) PIN on the RS-485 rear panel port of the **VP-8x8** unit
   - Connect the "B" (-) PIN on the RS-485 rear panel port of the **RC-1000N** to the "B" (-) PIN on the RS-485 rear panel port of the **VP-8x8** unit
   - If shielded twisted pair cable is used, the shield may be connected to the "GROUND" PIN on one of the units (for example, on the **RC-1000N**)
2. Connect the RS-485 terminal block port on the **VP-8x8** to the RS-485 port on the **VP-1608**.

1 The VP-8x8A is connected to the RC-1000N via the RS-485 connector of the VP-1201

3. Set the RS-485 termination dipswitch ON on the **VP-1608** (terminating the RS-485 line at 120Ω).
4. Set the RS-485 line termination DIP on the **RC-1000N** to ON[1].

You can add up to a total of 16 switchers by cascading them via the RS-485 terminal block connectors on the switchers.

5.4 Assigning Machine Numbers

When connecting several switchers to the **RC-1000N**, each has to be assigned a unique machine number, so the **RC-1000N** will be able to identify it.

For example, in Figure 3 four switchers are connected to the **RC-1000N** controller, each is assigned a different machine number:

- The **VP-1201** as MACHINE #1 (connected via RS-232)
- The **VP-8x8A** as MACHINE #2
- The **VP-8x8** as MACHINE #3
- The **VP-1608** as MACHINE #4

You can also set the machine numbers in a different order for your convenience[2], except for the machine that is connected via the RS-232, which must be set as MACHINE #1.

5.5 Dipswitch Settings

The **RC-1000N** includes four dipswitches on its rear panel. Table 3 defines the **RC-1000N** dipswitches:

Table 3: Dipswitch Definitions

Definition:	Function:
FLASH PROGRAM	ON: for the firmware upgrade procedure (see section 7); OFF: normal operation
One Touch Mode	ON: set the output once and then switch the selected inputs to that same output; OFF: both OUTPUT and INPUT are selected each time (see section 6.5)
N.U.	Not used (set to OFF)
RS-485 TERM	ON: RS-485 termination with 120Ω (for the first and last machines in the sequence) when a switcher is connected via the RS-485 port; OFF: RS-485 line is open (for other machines)

1 If it is the last unit in the sequence

2 For details of how to set the machine number on each switcher, refer to the relevant Kramer user manual

6 Using the RC-1000N

You can use the **RC-1000N** to operate the switchers in the audio-follow-video (AFV[1]) mode or the video mode[2].

Any switching operation performed by the **RC-1000N**[3] will be reflected on the individual switcher's display, and any switching operation performed by a switcher, will be reflected on the **RC-1000N** display[4] (if that machine is currently selected by the **RC-1000N** and the same output is selected).

To control the configuration illustrated in Figure 3, you can:

- Select the desired switcher for control (see section 6.1)
- Select the input to switch to the output (see section 6.2)
- Disconnect an output (see section 6.3)
- Lock the front panel (see section 6.4)

6.1 Selecting a Switcher

The **RC-1000N** is usually connected to several switchers. To perform a switching operation on a certain switcher, you have to first select the machine number[5] of that switcher[6].

To select a switcher, do the following:

1. Press the MACH #/TAKE button for a few seconds.
   The button blinks.
2. Press an IN / OUT SELECTOR button representing the machine # of the switcher you want to control.
   The number you selected flashes in the 7-segment display.
   In our example, if you want to control the **VP-8x8A** switcher[7] (as in Figure 3), press button 2.

1 Switching audio and video channels simultaneously

2 If the switcher is in the audio mode, its display will automatically shift to the video mode, and show the video input connections

3 Or PC

4 And PC

5 To set machine numbers, see section 5.4

6 If it is not currently selected

7 VP-8x8A was set to be Mach. # 2

3. Press the MACH #/TAKE button once again.
   The MACH #/TAKE button blinks a few more times and turns off.
   RC-1000N now controls the **VP-8x8A** switcher.

Every action taken by the **RC-1000N**, currently refers to **machine #2 (VP-8x8A**, as in Figure 3**)**

To control a machine (with a different machine #), just repeat the procedure above, and select the switcher's machine #.

For example, if you want to control the **VP-1608** switcher, press the MACH #/TAKE button for a few seconds until it blinks, press IN / OUT SELECTOR button 4, and press the MACH #/TAKE button again. The **RC-1000N** will now control the **VP-1608** machine.

6.2 Switching an Input to an Output

In the following example, the **RC-1000N** controls the **VP-8x8A**, and input 5 needs to be switched to output 3.

To select an input to switch to the output via the **RC-1000N**, do the following:

1. Make sure the MACH #/TAKE button is not illuminated or blinking.
2. Press an IN / OUT SELECTOR button to select the required output.
   In this example, press IN / OUT SELECTOR button 3.
   The SELECTOR button 3 illuminates and the input # which is currently routed to output 3 blinks on the 7-segment display.
3. Press the IN / OUT SELECTOR button to select the required input number.
   In this example, press IN / OUT SELECTOR button 5.
   The MACH #/TAKE button blinks and the 7-segment display shows the currently selected input number blinking.
4. Press the MACH #/TAKE button to confirm the action.
   The selected input number stops blinking on the 7-segment display.
   In this example, input 5 is now switched to output 3.
   The SELECTOR button 3 illuminates and the 7-segment display on the **VP-8x8A** shows that input 5 is switched to output 3.

Use the above procedure to continue routing via the **RC-1000N**.

6.3 Disconnecting an Output

You can disconnect an output via the **RC-1000N**. For example, to disconnect output 3 (which is currently selected[1]) on the **VP-8x8A** via the **RC-1000N**, do the following:

1. Press the IN / OUT SELECTOR button number 3 (which is illuminated) for about 2 seconds.
   The 7-segment display blinks 0 (zero) and the MACH #/TAKE button also blinks.
2. Press the MACH #/TAKE button.
   The 7-segment display stops blinking and displays 0 (zero).
   Output 3 is disconnected.

6.4 Locking the Front Panel

To prevent changing the settings accidentally or tampering with the unit via the front panel buttons, lock[2] your **RC-1000N**. Unlocking releases the protection mechanism.

To lock the **RC-1000N**:

- Press the LOCK button for more than two seconds, until the LOCK button is illuminated
  The front panel is locked. Pressing a button will have no effect other than causing the LOCK button to blink[3]

To unlock the **RC-1000N**:

- Press the illuminated LOCK button, for more than two seconds, until the LOCK button is no longer illuminated and the front panel unlocks

1 After the action of section 6.2

2 Nevertheless, even though the front panel is locked you can still operate via RS-232 or RS-485

3 Warning that you need to unlock to regain control via the front panel

6.5 Routing to a Selected Output (One Touch Mode)

In the One Touch mode, an output is pre-selected and stored for further routing, letting you route an input to that chosen output instantly without having to repeatedly select the same output.

To route an input to a stored output in the One Touch mode:

1. Set the ONE TOUCH MODE dipswitch ON.
2. Route an input to the output (see section 6.2).
   From now on, all inputs will be routed to that output in the One Touch mode.

For example, to route to output 1:

1. Set the ONE TOUCH MODE dipswitch ON.
2. Press the IN / OUT SELECTOR button 1 to select output 1.
   Selector button 1 illuminates and the input, which is currently routed to output 1, blinks on the 7-segment display.
3. Press an IN / OUT SELECTOR button[1] to select the input which is to be routed to output 1.
   From now on, all inputs will be routed to output 1 in the One Touch mode.
4. Press the IN / OUT SELECTOR button 3.
   Input 3 is instantly routed to output 1.
5. Press the IN / OUT SELECTOR button 2.
   Input 2 is instantly routed to output 1.

1 Press the currently selected input button if you do not want to change the selection

7 Flash Memory Upgrade

The **RC-1000N** firmware is located in FLASH memory, which lets you upgrade to the latest Kramer firmware version in minutes! The process involves:

- Downloading from the Internet (see section 7.1)
- Connecting the PC to the RS-232 port (see section 7.2)
- Upgrading Firmware (see section 7.3)

7.1 Downloading from the Internet

You can download the up-to-date file[1] from the Internet. To do so:

1. Go to our Web site at http://www.kramerelectronics.com and download the file: "*FLIP_RC1000N.zip*" from the Technical Support section.
2. Extract the file: "*FLIP_RC1000N.zip*" to a folder (for example, C:\Program Files\Kramer Flash).
3. Create a shortcut on your desktop to the file: "*FLIP.EXE*".

7.2 Connecting the PC to the RS-232 Port

Before installing the latest Kramer firmware version on a **RC-1000N** unit, do the following:

1. Connect the RS-232 TO PC port on the **RC-1000N** unit to the RS-232 DB9 COM port on your PC (see section 5.2).
   It is recommended that you use COM port[2] 2. However, if your computer has only one COM port, open the file: "*RC1000.cfg*" (located at C:\Program Files\Kramer Flash\RC1000.cfg) in **Notepad**, and change "*set port COM2*" to "*set port COM1*".
2. Set the FLASH PROGRAM dipswitch to ON
3. Connect your 12V DC power supply to the terminal block connector, taking care that **polarity is correct**.

1 The files indicated in this section are given as an example only. These file names are liable to change from time to time

2 The software is preset for use with COM port 2

7.3 Upgrading Firmware

Follow these steps to upgrade the firmware:

1. Double click the desktop icon: "*Shortcut to FLIP.EXE*".
   The Splash screen appears as follows:

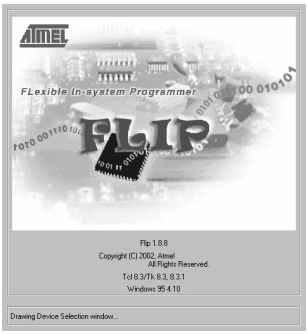


Figure 5: Splash Screen

2. After a few seconds, the Splash screen is replaced by the "*Atmel – Flip*" window:

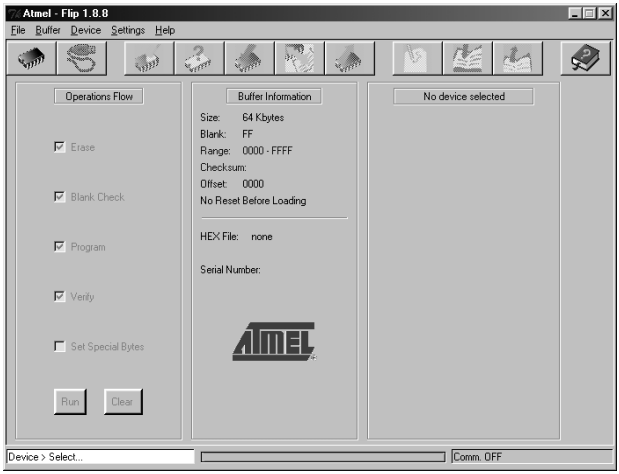


Figure 6: Atmel – Flip Window

3. Press the keyboard shortcut key *F2* (or select the "*Select*" command from the *Device* menu, or press the integrated circuit icon in the upper right corner of the window).
   The "*Device Selection*" window appears:

Figure 7: Device Selection Window

4. Click the button next to the name of the device and select from the list: AT89C51RD2:

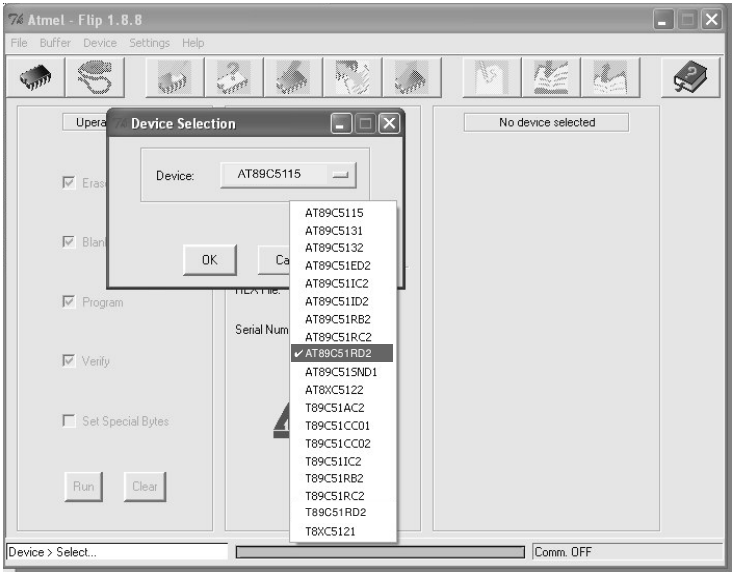


Figure 8: Selecting the Device from the Selection Window

5. Click OK and select "*Load Hex*" from the *File* menu.

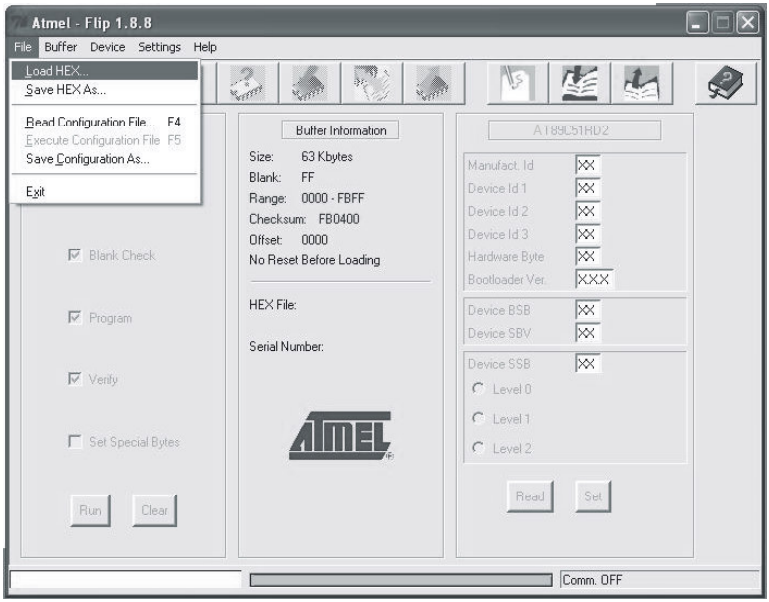


Figure 9: Loading the Hex

6. The Open File window opens. Select the correct HEX file that contains the updated version of the firmware for **RC-1000N** (for example ***1000NM_V1p2.hex***) and click Open.
7. Press the keyboard shortcut key *F3* (or select the "*Communication / RS232*" command from the *Settings* menu, or press the keys: *Alt SCR*).
   The "*RS232*" window appears. Change the COM port according to the configuration of your computer and select the 9600-baud rate:

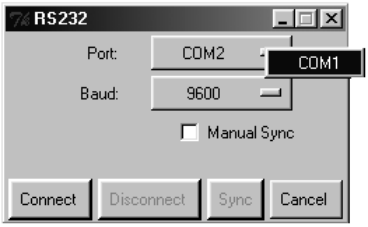


Figure 10: RS-232 Window

8. Click Connect.
   In the "*Atmel – Flip*" window, in the *Operations Flow* column, the *Run* button is active, and the name of the chip appears as the name of the third column: *AT89C51RD2*.

Verify that in the *Buffer Information* column, the "*HEX File: RC-1000N.hex*" appears.

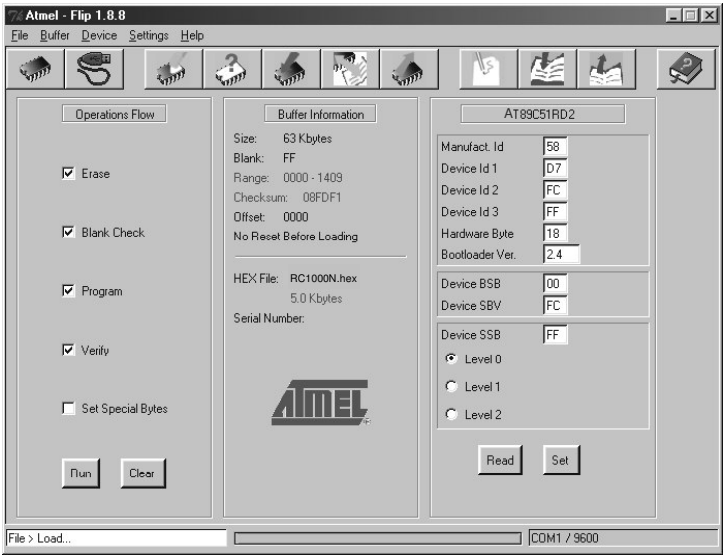


Figure 11: Atmel – Flip Window (Connected)

9. Click *Run*.
   After each stage of the operation is completed, the check-box for that stage becomes colored green[1].
   When the operation is completed, all 4 check-boxes will be colored green and the status bar message: *Memory Verify Pass* appears[2]:

1 See also the blue progress indicator on the status bar

2 If an error message: "Not Finished" shows, click Run again

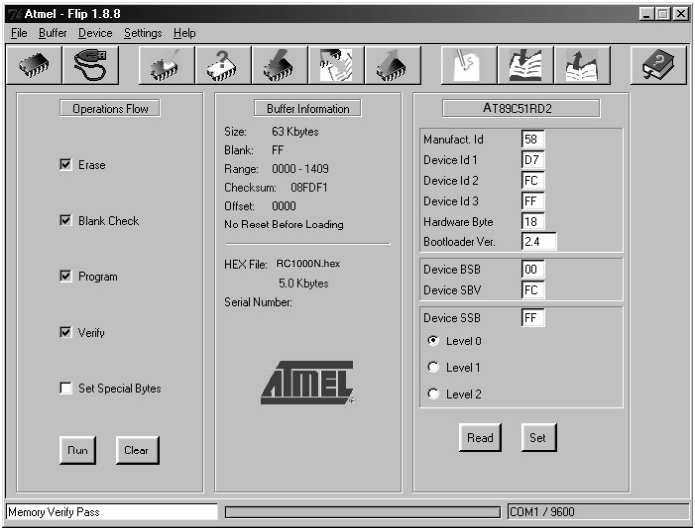


Figure 12: Atmel – Flip Window (Operation Completed)

10. Close the "*Atmel – Flip*" window.
11. Disconnect the power on the **RC-1000N**.
12. Set the FLASH PROGRAM dipswitch to OFF.
13. Connect the power on the **RC-1000N**.

8 Technical Specifications

Table 4 includes the technical specifications:

Table 4: Technical Specifications[1] *of the RC-1000N*

PORTS:	3 RS-232 ports on terminal block connectors; RS-485 port on a terminal block connector
POWER SOURCE:	12 VDC, 100mA
DIMENSIONS:	Topside: 11.4cm x 11.4cm (4.5" x 4.5") W, H
WEIGHT:	0.3 kg (0.67 lbs.) approx.
ACCESSORIES:	Power supply

1 Specifications are subject to change without notice

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed.
3. Damage, deterioration or malfunction resulting from:
   - i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   - ii) Product modification, or failure to follow instructions supplied with the product
   - iii) Repair or attempted repair by anyone not authorized by Kramer
   - iv) Any shipment of the product (claims must be presented to the carrier)
   - v) Removal or installation of the product
   - vi) Any other cause, which does not relate to a product defect
   - vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.
NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.
This equipment has been tested to determine compliance with the requirements of:

EN-50081:	"Electromagnetic compatibility (EMC); generic emission standard. Part 1: Residential, commercial and light industry"
EN-50082:	"Electromagnetic compatibility (EMC) generic immunity standard. Part 1: Residential, commercial and light industry environment".
CFR-47:	FCC Rules and Regulations: Part 15: "Radio frequency devices Subpart B – Unintentional radiators"

CAUTION!

- Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- Use the supplied DC power supply to feed power to the machine.
- Please use recommended interconnection cables to connect the machine to other components.

For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com, where updates to this user manual may be found.
We welcome your questions, comments and feedback.

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

Kramer Electronics, Ltd.
Web site: www.kramerelectronics.com
E-mail: info@kramerel.com
P/N: 2900-000118 REV 1